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Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

Sub-Committee of Experts on the Transport of Dangerous Goods

Fifty-third session
Geneva, 25 June-4 July 2018
Item 4 (e) of the provisional agenda
Electric storage systems: sodium-ion batteries

Sodium-ion batteries

Transmitted by the expert from the United Kingdom*

Introduction

1. At the fifty-second session of the Sub-Committee the expert from the United Kingdom presented informal document INF.11 which:

(a) Provided a background to sodium-ion battery technology;

(b) Explained the differences in comparison to lithium-ion battery technology;

(c) Explained the similarities between a shorted sodium-ion battery and a super capacitor; and

(d) Discussed the options for how they might be addressed in the Model Regulations.

2. The presentation demonstrated that cells and batteries based on sodium-ion technology which are shorted or discharged pose no safety concern to people, property or the environment during carriage. Nevertheless, such cells and batteries may be wrongly assumed to be hazardous by people in the transport chain. Therefore the Sub-Committee agreed that the Model Regulations should refer to them.

3. This document contains a proposal for shorted and discharged sodium-ion cells and batteries for consideration at this session and seeks views on follow-up work on an approach for their carriage when charged.

* In accordance with the programme of work of the Sub-Committee for 2017–2018 approved by the Committee at its eighth session (see ST/SG/AC.10/C.3/100, paragraph 98 and ST/SG/AC.10/44, para. 14).

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Background

4. The proposal made below solely addresses sodium-ion cells and batteries that are shorted or discharged. The ease with which these batteries can be shorted and the resultant minimising of any risk during transport means that this is the condition in which most commercial consignments will be shipped. The inclusion of this proposal in the twenty-first revised edition of the Model Regulations would be timely for this emerging technology.

Proposal

5. For UN No. 3292, insert a new special provision "XXX" in Column (6) of the Dangerous Goods List in Chapter 3.2.

6. Add a new special provision "XXX" in Chapter 3.3 as follows:

"XXX Sodium-ion cells and batteries offered for transport either loose or installed in equipment are not subject to other provisions of these Regulations if they meet the following:

(a) Cells and batteries are transported in a shorted or discharged state;

(b) Cells, batteries and equipment containing cells and/or batteries are packed in packaging that meets the general provisions of 4.1.1.1 and 4.1.1.2, large robust batteries may be transported on pallets or in suitable handling devices."

Follow-up work for future sessions

7. In accordance with the Sub-Committee's advice from the fifty-second session, the expert from the United Kingdom will return with further information and proposals to address the safe transport of sodium-ion batteries in a charged state, taking account of their electrical and chemical hazards and applicable test methods.

8. In taking this matter forward, the expert from the United Kingdom is considering making a proposal for the next session for adding provisions to packing instruction P408 for charged sodium ion batteries that would restrict carriage to packaging that, in the event of one cell or battery entering into a state of thermal runaway:

(a) Other batteries in the package will not go into thermal runaway;

(b) Packaging material will not ignite; and

(c) The outside surface temperature of the completed package shall not exceed 100°C.

9. The expert from the United Kingdom would welcome early feedback on this possible approach.